

Substitute House Bill 1951

Visual Screening of Children in Public Schools—Final Report

December 2006

Washington State Department of

Health

Division of Community and Family Health
Office of Maternal and Child Health

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Substitute House Bill 1951
**Visual Screening of Children in Public Schools—Final
Report**

December 2006



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Acknowledgments

This report and the resulting recommendations are the culmination of the dedicated work of the Vision Screening for Children Expert Workgroup that met monthly from September 2005 through August 2006 to complete their task. They have dutifully and systematically analyzed the issues to develop the comments and recommendations that are included in this report. Each one gave generously of their time, expertise and knowledge to provide the necessary input to complete this project in a timely manner.

A list of Workgroup members can be found in Appendix A.

Lastly, acknowledgement is given to Debbie Roper, Secretary Administrative in Department of Health/Child & Adolescent Health section, who provided support to the workgroup by arranging meeting space, typing summary minutes, arranging travel for participants and accomplishing the many tasks that support successful meetings.

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Executive Summary

In 2005, the Legislature enacted Substitute House Bill 1951 (SHB 1951), which directed the Department of Health to convene a workgroup to reevaluate visual screening of children in public schools and make any recommendations regarding changes to the current vision screening rules under the authority of the State Board of Health. In passing this act, the legislature recognized the importance of vision and the importance of vision screening to detect disorders that may significantly impact a child's life skills, including the ability to learn.

SHB 1951 required the workgroup to consider, at a minimum:

- The benefits of complete eye exams on public school children.
- When visual screening, complete eye exams, or both, should take place in preschool or kindergarten through high school to ensure readiness to learn.
- What screening techniques would be appropriate in a school setting.

Recommendations A, B and C address those considerations:

- A-1 Any child failing the school vision screening at any age will be referred for a comprehensive exam as follows: a. Mandating comprehensive eye examinations for all children entering school is currently prohibitive due to cost.
- B-1 Expand screening to pre-school age by requiring proof of screening or exam within 12 months prior to entry into kindergarten or initial entry into school. No child will be excluded from school entry for failure to produce proof of screening or exam.
- B-2 Maintain the current screening schedule for distance acuity at kindergarten, and grades one, two, three, five, and seven. For children who produce proof of screening or exam at school entry, distance acuity screening in kindergarten or Grade 1 may be waived. In addition, screening will be expanded to require stereo vision testing in Grade 1, and color vision testing for Red-Green Color Deficiency in males in Grade 1 or Grade 2. New resources are required to support this recommendation.
- C-1 All vision screening programs should be allowed to adopt evidence-based screening techniques and tools (in addition to those required) as described in professional preferred practice patterns.

In the course of their discussions, the workgroup also developed the following additional policy considerations:

- D-1 Recommend a Current Procedural Terminology (CPT) code for vision screening be established on a national level. Establishing vision screening as a billable procedure would help ensure that providers include it as part of well-child visits to

detect children at an early age and have a more systematic way of identifying children for follow-up care.

- D-2 Explore with the Washington State Insurance Commissioner a proposal that insurance companies be required to compensate vision screening as a covered medical benefit.
- E-1 Develop and provide educational information for parents to inform them of school age vision problems. New resources are required to support development and dissemination of these materials.
- F-1 Develop standards for vision screening process in Washington State and for training of screeners to promote quality assurance and support consistency among programs. New resources are required to support development of the process, provide on-going training and make the standards available.
- G-1 Parents of children with neurodevelopmental delays should be encouraged through the use of anticipatory guidance to seek a comprehensive eye exam for their children in lieu of screening, when appropriate. In addition, a parent-oriented checklist could be developed and distributed through schools to alert parents on what to watch for in their children that may indicate visual difficulties.

The final report contains the full recommendations put forth by the workgroup.

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Introduction

Vision Disorders from a National Perspective

Vision disorders are the fourth most prevalent or widespread class of disability in the United States and the most prevalent handicapping conditions in childhood. Normal visual development requires the brain to receive equally clear, focused images from both eyes simultaneously in order for visual pathways to develop properly. Vision screening and comprehensive eye examinations can detect conditions that may lead to permanent and irreversible visual deficit. Permanent and irreversible visual deficits may adversely affect school performance. Early detection increases the likelihood for effective treatment and decreases the negative impact of these disorders.

Vision problems are common among children and affect nearly 13.5 million children nationwide. The U.S. Preventive Services Task Force (USPSTF) has identified that visual impairment in young children affects five to ten percent of all preschoolers. Many of these vision problems are treatable.

The most common vision disorders seen in children are amblyopia, strabismus and refractive errors. Amblyopia ("lazy eye") is a serious public health problem and the most serious of the three vision disorders listed. It is the leading cause of monocular vision loss in America. It is estimated that amblyopia affects five percent of the general U.S. population and three to five percent of preschool age children (200,000 of four million preschool children in the U.S.), while an estimated two to four percent of the nation's children have strabismus (misalignment). The incidence of refractive errors is higher than amblyopia or strabismus, but the consequences are much less severe. The frequency of occurrence of these disorders in "high risk" groups such as economically and socially disadvantaged children is higher (up to ten percent).

Vision loss from amblyopia occurs when focusing problems, eye misalignment, or diseases of the eye interfere with normal development of the brain's vision center. Only during the critical period of brain development early in life can the detection and treatment of amblyopia prevent life-long vision loss. After age nine, it is generally too late to restore vision. An estimated five million adults have irreversible vision loss due to undetected amblyopia, and over 40 million children nationwide are at risk for permanent vision loss.

Challenges in Describing the Extent of the Problem Among School Aged Children in Washington

Role of Standards of Practice for Vision Screening in Washington Schools

There are neither national standards for school vision screening, nor state standards of practice that school districts are required to follow. As a result, equipment, methods, techniques and quality of screening vary widely from district to district and from school to school. Although Washington Administrative Code (WAC) rules mandate screening frequency, schools may choose to screen children in additional grades if resources allow. Distance visual acuity is the only vision screening the WAC rules mandate. There is no permissive language in the WAC about using equipment other than the Standard Snellen or Snellen E chart. However, many schools screen for other vision problems, such as color vision, if they desire and have the resources.

Usually nurses perform screening, but some districts also engage other non-health school staff, health assistants, and parent volunteers to screen in schools. There is a wide disparity in the background, training, preparation, and experience of screeners. There is also no uniform standard of competency for screeners.

Vision testing is recorded on forms and kept in each student's educational file. There is no requirement that districts report the results to the Office of Superintendent of Public Instruction (OSPI) in order to obtain statewide data. OSPI has developed model forms, but schools are not mandated to use them and often develop their own. Even if data were collected, there is no standard method for collecting vision screening results and the usefulness of the data would be questionable because of lack of uniformity and standards of practice.

Schools or districts do not consistently track how many children fail screenings and are referred for more comprehensive exams, how many of those children referred actually received follow-up care, and how many of those children required further treatment. Therefore, it is difficult to determine how widespread vision problems are among children in Washington State.

Vision Screening as a Public Health Practice

Screening is a primary prevention activity² and a sound public health practice that can lead to early intervention.

² Prevention strategies can either be primary, secondary or tertiary in nature. Primary prevention activities usually involve identifying a condition or disease in a general population. Secondary or tertiary activities involve a specific subset of a general population such as people who are at higher risk.

There is evidence and professional support for identifying visual defects at an early age. The historical purpose of vision screening is to detect and treat vision problems in order to improve quality of life and may enhance learning. Evidence is inconsistent about the relationship of early detection and treatment of vision problems to learning; there is strong evidence that early detection and treatment improves the quality of life.

Early childhood is the most critical period of development for the vision system. When a child reaches the age of nine or ten years, the vision system is developed. Early vision screening helps prevent blindness and permanent impairment from most eye diseases. Eye disorders can be reduced or prevented with early detection and treatment. From a public health standpoint, vision screening is an appropriate and necessary activity.

Issues Regarding Current Approaches to Vision Screening

Currently there is an increase in the amount of social and political momentum to improve the way we screen our nation's children for vision disorders. Several states have enacted legislation or amended laws to require screening or comprehensive exams prior to school entry. Several other states are considering similar legislation in the next year.

There are three major approaches to identifying children with vision problems:

- School-based vision screening programs.
- Community-based or office-based screening programs.
- Comprehensive eye exams performed by an optometrist or ophthalmologist.

A major difficulty in determining the benefits of vision screening versus comprehensive eye exams for school-age children is that there are conflicting recommendations among health professionals about the best strategies to use to detect vision problems among large groups of children. The American Optometric Association and the American Public Health Association recommend comprehensive vision examinations for all children starting at six months of age and at regular intervals thereafter. The American Academy of Pediatrics and the American Academy of Ophthalmology support vision screenings for all children by age three and at regular intervals after that age.

In addition, there are differing opinions about what screening tools are most effective, who should be performing the screenings, what are the most cost effective tools to use in a school setting, who should assume the cost of referrals for comprehensive eye exams, and at what age screening should begin. There are studies underway by the National Institute of Health and other health entities to address some of these issues and to gather data, but there currently is no sufficient body of research available to answer the many important questions that are critical to establishing good public policy.

In developing their final recommendations for the legislature and State Board of Health (SBOH), the workgroup systematically addressed these issues using evidenced-based and scientifically-based decision making whenever possible.

This report summarizes the findings, conclusions, and recommendations of the Vision Screening for Children Expert Workgroup.

Meeting the Legislative Requirements of SHB1951

The legislation directed the Department of Health (DOH) to convene a workgroup to "reevaluate visual screening of children in public schools and make any recommendations regarding changes to the rules." In passing this act, the legislature recognized the importance of vision and the importance of vision screening to detect disorders that may significantly impact a child's life skills, including the ability to learn. Specifically, the workgroup was asked to:

- Consider the benefits of complete eye exams for public school children.
- Consider when visual screening, complete eye exams, or both should take place in preschool or kindergarten through high school in order to ensure children are best prepared for the learning environment.
- Consider what screening techniques would be appropriate in a school setting.

Department of Health staff consulted with Office of Superintendent of Public Instruction, the State Board of Health (SBOH), the Optometric Physicians of Washington, and the Washington Academy of Eye Physicians and Surgeons to develop recommendations. The legislation required that a preliminary report be made to SBOH and the legislature by December 2005, and final recommendations be made by December 2006.

DOH invited experts and interested persons from the following groups to serve on the workgroup:

- Office of Superintendent of Public Instruction (OSPI)
- State Board of Health (SBOH)
- Department of Health (DOH) Children with Special Health Care Needs Program
- Pediatric Ophthalmology
- Pediatric Optometry
- DOH Optometry Board
- DOH Medical Quality Assurance Commission (MQAC)
- School Nurse Organization of Washington (SNOW)
- Education Service District School Nurse Corps Supervisors (SNCS)
- National Association of Pediatric Nurse Practitioners (NAPNP)
- Washington Chapter of the American Academy of Pediatricians (WCAAP)

Representatives of NAPNP, WCAAP and DOH MQAC all declined the invitation to participate because of previous commitments.

The workgroup met monthly from September 2005 through August 2006.

Processes Used to Gather Information

In developing recommendations to the SBOH and the legislature, the workgroup considered the following questions:

- What are the most common vision disorders among school-aged children in Washington?
- What screening is available for these disorders?
- What screening tools are appropriate in a school setting?
- Should screening, complete eye exams, or both, take place in preschool through high school? What are the benefits and barriers of each?
- How can parental involvement in providing for their children's eye care be increased?
- How do the current rules and authorities address the common disorders seen in school age children? What is missing?
- How does current screening required by WAC address the common disorders seen in school-age children? What is missing?

The workgroup completed and reviewed an extensive literature review and synthesized their research. Documents reviewed and discussed included position statements, state and federal policies, research surveys and studies, articles, and guidelines. For consistency of recommendations and best practices, the workgroup reviewed three comprehensive documents:

- The National Institute of Health/National Eye Institute Vision in Preschoolers Study—a three phase study over a period of six years involving 1,400 preschoolers.
- To See or Not to See: Screening the Vision of Children in School—a comprehensive guideline published in July 2005 by the National Association of School Nurses (NASN). Reviewers included pediatric ophthalmologists, pediatric optometrists, school nurses and representatives from the U.S. Department of Education and U.S. Department of Health and Human Services.
- Guidelines for vision screening from Prevent Blindness America.

The workgroup also discussed applicable legal authority to determine whether recommendations would require a change in the current Washington Administrative Code (WAC) or Revised Code of Washington (RCW). In Washington State, RCW 28A.210.020 governs the vision screening for children in public schools. It grants school boards the authority to require screening for visual acuity of "all children attending schools in their districts..." This statute requires the State Board of Health (SBOH) to consult with the Office of Superintendent of Public Instruction (OSPI) regarding the

specifics of the administration of the screenings including the qualifications of the persons who provide the screenings.

The specific rules governing this statute (WAC 246-760) are under the jurisdiction and authority of the SBOH. They require screening to be conducted in kindergarten, and in grades one, two, three, five and seven; or anytime a child shows signs of vision loss. In addition, if resources permit, schools may annually screen children in other grade levels. These regulations also specify the frequency of screening, the equipment to be used, the procedure, the referral process for failed screenings and the qualifications of vision screening personnel. Currently, ophthalmologists, optometrists, opticians and others with a conflict of interest are prohibited from performing vision screening in a school setting.

Guest speakers from Washington State agencies, including public education presented the following information to the group:

- How school screening works in practice in the real world (two school nurses from Benton-Franklin and King counties).
- The jurisdictional boundaries and regulations for preschoolers (Healthy Child Care Washington, Department of Social and Health Services/Division of Childcare and Early Learning, Community, Trade and Economic Development/Early Childhood Education and Assistance Program).
- Regulations around the new Disabilities Education Improvement Act law and special education regulations (Office of the Superintendent of Public Instruction).

In addition to Washington State experts, the workgroup consulted with Massachusetts and Minnesota. These states recently enacted legislation requiring comprehensive vision exams prior to school entry and have found creative ways to fund those initiatives.

A broad array of stakeholders were asked for input. Executive Diversity Services/MGS Consulting developed a process for stakeholder engagement for the workgroup (See Appendix D). A database of stakeholders including parents, school administrators, school staff, local school boards, educational service districts, and private providers was compiled. Once the workgroup completed draft recommendations, input was gathered from a broader stakeholder audience using a variety of media that included a web-based survey, focus groups, and individual interviews with stakeholders.

Final recommendations were reached by consensus.

Recommendations and Additional Issues for Consideration

While the legislation asked to consider three issues, the expert workgroup also considered other related issues and has offered recommendations for consideration on these as well.

I. Recommendations to meet the minimum requirements of SHB1951

ISSUE A: Consider the benefits of complete eye exams for public school children.

- **Recommendation A-1:** Complete eye exams for children are considered the gold standard³ by most health care providers; however, the cost, access to providers, and resources needed to provide or mandate comprehensive examinations for all children is currently prohibitive. Children who fail the school screening at any age will be referred for a comprehensive exam as specified in the current WAC rules.

ISSUE B: Consider when visual screening, complete eye exams, or both, should take place in preschool or kindergarten through high school in order to ensure children are best prepared for the learning environment.

- **Recommendation B-1:** Require proof of screening or exam prior to school entry.

Support earlier detection of vision-threatening disorders through expanded screening to preschool age by requiring proof of screening or exam within 12 months prior to entry into kindergarten or initial entry into school. No child will be excluded from school entry for failure to produce proof of screening or exam.

This recommendation requires a change to both the RCW and the WAC rules. The RCW currently only gives authority for screening vision for "children attending school" and not for preschool-age children.

Research shows that earlier diagnosis of treatable vision-threatening childhood diseases allows for more effective treatment of these disorders. Preschool screening is also supported in a Healthy People 2010 objective, a set of national health objectives promoted by the U.S. Department of Health and Human Services. Position statements from American Academy of Ophthalmology, American Optometric Association, American Public Health Association, and American Academy of Pediatrics also support early detection and treatment of vision problems through screening of preschool-age children. Other states including Kentucky, Michigan, Kansas, Washington DC, and Massachusetts have implemented preschool vision screening requirements and could provide valuable information on their experience.

While the expert workgroup strongly supports this recommendation, they also acknowledge the barriers to implementation at this time. Some of the factors to consider to ensure the success of an RCW change and implementation plan are offered below:

A number of professional provider organizations support this premise. Complete eye exams are diagnostic in nature and are performed by credentialed professionals using sophisticated equipment. Screening is often performed by lay persons whose purpose is to identify potential problems and refer for more comprehensive testing.

- ▶ Timing of reforms proposed by Washington Learns Early Learning Council, which could impact this recommendation.
- ▶ The newly created Department of Early Learning may have authority for preschool-age children, but is not yet up and running. If they have the authority, they must be consulted.
- ▶ Concerns of stakeholders, particularly school nurses and administrators, about the burden to schools and lack of resources will need to be addressed.

DOH contracted with MGS Consulting Services to gather stakeholder input on the issue of whether children should have their vision screened before they enter kindergarten (option one) or upon their first entry into public school (option two). For option one, the major concerns cited by all of the stakeholder groups was cost to parents and schools, follow-up and access to providers and implementation concerns. (See Appendix D for the full report).

▪ **Recommendation B-2: Expanded Screening and Screening Tools**

Maintain the current screening schedule for distance acuity at kindergarten, and grades one, two, three, five, and seven. For children who produce proof of screening or exam at school entry, screening for distance acuity in kindergarten or Grade 1 may be waived.

In addition to distance acuity, screening in school should be expanded to require stereo vision testing in Grade 1, and color vision testing for Red-Green Color Deficiency in males in Grade 1 or Grade 2. Any child who fails the vision screening at any age will be referred for a comprehensive eye exam. This recommendation will require a WAC change.

Resources will need to be allocated to support stereo vision and color vision testing in each school as part of the vision screening process. Increased resource needs include new tools for screening stereo vision and color deficiency as well as increased time for school nurses to screen or supervise screening activities.

As with recommendation B-1, MGS gathered stakeholder input on the proposal to expand the vision screening that currently takes place at school for children in kindergarten and grades, one, two, three, five, and seven. The major concerns cited by stakeholder groups were training, accuracy, liability, and cost to parents and schools.

For recommendations B-1 and B-2, the stakeholder groups comprised of parents, health care professionals, and eye care professionals indicated moderate support, but had significant concerns regarding how these options would be implemented. The stakeholder group of school personnel generally did not support either option.

ISSUE: Consider what screening techniques would be appropriate in a school setting.

- **Recommendation C-1: All vision screening programs should be allowed to adopt evidence-based screening techniques and tools (in addition to those required for distance visual acuity testing, stereo vision testing and color vision testing for**

Red-Green Color Deficiency) as described in professional preferred practice patterns. These techniques and tools may include:

- ▶ Near vision testing (Grade 2 and above)
- ▶ Autorefraction
- ▶ Photoscreening
- ▶ Computerized testing tools
- ▶ Cover testing
- ▶ Parental checklist for vision problems

This recommendation requires a WAC change.

II. Other issues considered by the Expert Workgroup

ISSUE D: Reimbursement for Providers for Vision Screening

- **Recommendation D-1:** A Current Procedural Terminology (CPT) code for vision screening should be established on a national level. Establishment of a CPT code for vision screening as a billable procedure would help ensure that providers include it as part of well-child visits to detect children at an early age who require further examination and treatment and have a more systematic way of identifying children for follow-up care.
- **Recommendation D-2:** After further analysis, including input from stakeholders, explore with the Washington State Insurance Commissioner a proposal that insurance companies be required to compensate vision screening as a covered medical benefit.

ISSUE E: Educational Information for Parents

- **Recommendation E-1:** Provide educational information to parents to inform them of school-age vision problems. There is no authority to require creating and distributing information for parents. Information could be developed, in consultation with OSPI, Washington Academy of Eye Physicians and Surgeons (WAEPS), and Optometric Physicians of Washington (OPW) to be distributed in schools as part of the communication to parents that occurs at the start of each school year. In order to provide this information, new resources are required to support the development and dissemination of these materials. Schools are already required to provide a broad array of information to parents.

ISSUE F: Standards for Screening, Training of Screeners

- **Recommendation F-1:** Develop standards and a process to train both lay and professional screeners.

Currently no national or state standards for the vision screening process or for training lay and professional screeners. Lay screeners might include parents, Lion's Club members, or other members of the community. Professional

screeners include school nurses, physicians, and professional staff in vision care offices. Developing standards would promote quality assurance and support consistency among programs. Standards could be developed, in consultation with OSPI, the Department of Early Learning, SBOH, WAEPS and OPW. New resources would need to be allocated to support development of the process, provide on-going training, and make the standards available. The American Academy of Pediatrics (AAP) standards for vision screening should be recommended in any educational documents and be used to guide standard development for vision screening in Washington State.

ISSUE G: Anticipatory Guidance for Parents.

- **Recommendation G-1:** Although no consistent definition of "neurodevelopmental delay" is used in Washington State, it is understood that children with diagnosed neurodevelopmental delays often have vision problems as well as other disabilities. Parents of these children should be encouraged through the use of anticipatory guidance to seek a comprehensive eye exam for their children in lieu of screening when appropriate. Additionally, a parent-oriented checklist could be provided to alert parents on what to watch for in their children that may indicate visual difficulties. This checklist could be distributed in a variety of ways including posting to websites, sending home with other school information, or posting in provider offices.

Conclusion

Screening children for visual deficits at an early age is good public health practice, can prevent permanent visual deficits due to certain conditions, and has the potential to enhance a child's readiness to learn. The workgroup recommends requiring proof of screening or an exam prior to school entry, and expanded screening and associated tools to evaluate for some conditions.

This report contained a number of other considerations to complement the work accomplished under Substitute House Bill 1951. One important consideration would be educating providers, parents, and the larger community about the importance of vision screening. Furthermore, there should be efforts to enhance the overall quality of vision screening and a commitment to evaluate the outcome of these efforts.

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Appendices

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- B. Copy of Substitute House Bill 1951
- C. Cost-Benefit Analysis
- D. Report of Stakeholder Engagement Process
- E. Glossary of Terms

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APPENDIX A—Expert Workgroup Members

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APPENDIX B—Copy of Substitute House Bill 1951

SUBSTITUTE HOUSE BILL 1951

AS AMENDED BY THE SENATE

Passed Legislature - 2005 Regular Session

State of Washington 59th Legislature 2005 Regular Session

By House Committee on Education (originally sponsored by
Representatives Quall, Talcott, Haler, Morrell, Campbell,
O'Brien, Hankins, Kagi and McDermott)

READ FIRST TIME 03/07/05.

1 AN ACT Relating to vision exams for school-aged children; and
2 creating new sections.

3 BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF WASHINGTON:

4 NEW SECTION. **Sec. 1.** The legislature finds that:

5 (1) Vision is one of the primary senses used in the early learning
6 process;

7 (2) Vision problems affecting preschool and school-age children can
8 impact a child's ability to learn;

9 (3) Economically disadvantaged children have less access to health
10 care and therefore, may have a proportionally greater likelihood of
11 having undiagnosed vision problems that may affect their ability to
12 learn;

13 (4) Vision problems in young children can be misinterpreted as
14 neurodevelopmental delay or as learning disabilities; and

15 (5) Current screening for visual acuity at distance is insufficient
16 to detect all vision defects.

17 NEW SECTION. **Sec. 2.** (1) The department of health shall convene
p. 1 SHB 1951.PL

1 a work group to reevaluate visual screening of children in public
2 schools and make any recommendations regarding changes to the rules.

3 In developing its recommendations, the work group shall, at a minimum:

4 (a) Consider the benefits of complete eye exams on public school
5 children;

6 (b) Consider when visual screening, complete eye exams, or both
7 should take place in preschool or kindergarten through high school in
8 order to ensure children are best prepared for the learning
9 environment; and

10 (c) Consider what screening techniques would be appropriate in a
11 school setting.

12 (2) In developing the recommendations, the department of health
13 shall consult with the office of the superintendent of public
14 instruction, the state board of health, the optometric physicians of
15 Washington, and the Washington academy of eye physicians and surgeons.

16 (3) The work group shall make a preliminary report to the
17 legislature and the state board of health by December 1, 2005. The
18 work group shall make final recommendations to the legislature and to
19 the state board of health by December 1, 2006.

20 (4) If specific funding for this act is not referenced by bill or
21 chapter number in the biennial omnibus appropriations act by June 30,
2005, this act is null and void.

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SHB 1951.PL p. 2

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APPENDIX C—Cost and Benefit Discussion

**Cost and Benefit Discussion
on Vision Screening of School-Age Children**

September 2006

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Cost and Benefit Discussion on Vision Screening of School-Age Children

September 2006

Cost and Benefit Assumptions, Methodology, and Data

This section will look at costs and benefits of the key recommendations developed by the Vision Screening for Children Expert Workgroup: 1) requiring screening or exams prior to school entry; and 2) expanding screening and screening tools.

Assumptions

Costs of either screening or comprehensive exams can be one-time costs or ongoing. Costs are also associated with leaving visual impairments untreated. Benefits are most often realized over time. Benefits may include identifying the need for vision treatment that might have otherwise gone undetected, as well as the benefits of obtaining treatment sooner rather than later. Additionally, benefits may include not only actual financial costs and benefits, but those that are intangible to which a financial value is associated such as ability to engage in appropriate developmental activities or compete in the job market.

Methodology

The basis of this analysis is derived from a model for determining cost effectiveness developed by Abt Associates, Inc. for the Vision Council of America on the impact and cost of eye exams for children (2004). It is the most definitive analysis in the literature and helps to quantify some of the direct and indirect costs associated with screening, exams, and treatment¹⁷. The visual impairment that was analyzed for this model was amblyopia. This visual defect was also identified by the workgroup as one of the most common in children and one that can have devastating effects if not treated early.

In this model, cost effectiveness is assessed using a cost-utility analysis in which the benefits associated with an intervention, which result from earlier detection and treatment, are compared against the costs associated with the exams. The goal of this analysis was to evaluate whether the improvements in health that might result from comprehensive exams justify the expenditures relative to other choices.

Benefits are measured in terms of additional quality using a quality adjusted life years (QALY) measurement. A QALY takes into account the quantity and the quality of life generated by healthcare interventions, and provides a common unit of measurement for comparing the benefits that rise from various interventions. The scale used is generally zero to one, where zero is defined as being equivalent to death and one as equivalent to optimal health. When combined with information on costs of the interventions, it is possible to calculate the cost per quality adjusted life year. While this measure has limitations, it allows for measuring marginal costs and benefits of one intervention over another.

In the U.S., there is no standard accepted threshold for QALY; however, it is commonly accepted that a cost effectiveness of \$50,000 or less per QALY is considered cost effective. A cost effectiveness of \$20,000 or less per QALY is considered very cost effective.

Cost effectiveness of various interventions for amblyopia depends on several parameters¹⁷:

1. **Prevalence of amblyopia:** Few studies have measured the prevalence using a large, nationally representative sample. The studies available vary in their estimated prevalence with a range from 3 percent to 5 per cent. Prevent Blindness America, the nation's leading volunteer eye health and safety organization dedicated to fighting blindness and saving sight, estimates prevalence for amblyopia of 1.6 per cent to 3.6 per cent. They identify that this prevalence is higher in the medically underserved.
2. **Sensitivity and specificity of comprehensive exams and vision screenings:** While the concern about the quality of routine vision screening is a major reason for supporting comprehensive eye exams, there are limitations in the literature and the literature is not conclusive on this topic.
3. **Costs associated with vision screenings, comprehensive exams and treatment:** Comprehensive eye exams are commonly used as the "gold standard" to measure the performance of vision screenings because it is assumed that they are more accurate and more sensitive than screenings. By using comprehensive eye exams as a "gold standard", it is assumed they have higher sensitivity and specificity (see Appendix A). Because comprehensive eye exams are provided by either an ophthalmologist or an optometrist, the children at least have an initial contact with a professional provider. This does not, however, ensure that follow-up care is accessed by parents.
4. **Probability of success of the treatment and age at which treatment is initiated:** Success of treatment and long-term benefits depends on the age the condition is identified and treatment. The earlier the identification, the more benefit derived from treatment.

Costs of Community-based or Office-based Screening (includes well-child exams, Lion's Club sponsored events, other community programs)

Before discussing the cost-benefit of school based screening, it is important to look at alternative venues for screening and the costs and benefits associated with them. The cost in 2004 dollars for community screening programs was estimated at \$15.00 per child. Additional cost estimates associated with screening include subsequent eye exams as part of usual eye care (\$47), costs associated with false positive screenings (\$6) and cost of treatment (\$29) for a screening cost per child of \$97¹⁷. This cost is much less than comparable costs for a comprehensive exam which total \$259. (See breakdown of costs in next section).

In terms of testing reliability, screening tests have a sensitivity measure of 65 per cent and a specificity measure of 90 per cent compared to comprehensive exams which have a sensitivity measure of 95 per cent and a specificity measure of 98 per cent¹⁷. The lower the sensitivity, the more children with vision problems are missed and not referred for appropriate follow up care. The higher the specificity, the fewer false positives occur. It

follows, then, that screening tests are less reliable in picking up all of the children who may have a problem and also have a higher likelihood of a false positive referral by identifying children for a condition that does not actually exist.

While screening programs clearly cost less per successful treatment than comprehensive exams, these higher rates of false positive referrals generate additional costs but no benefits in terms of treating amblyopia. In addition, more children are missed who actually should be referred for a condition. There is also a cost associated with those children that are left undetected and untreated.

Additionally, little is known about how children are screened in community or office programs and how many are referred for diagnostic follow-up. Charges for provider visits are generally wrapped into Early Periodic Screening Diagnosis and Treatment (EPSDT) exams and paid for by private or public insurance.

Costs to Schools for Vision Screening

School-based screening programs are provided at no charge to parents, are intended to identify children at risk for a condition, and are provided when the prevalence of a condition is substantial. Costs of vision screening in schools can include several considerations¹:

1. Cost to school districts to conduct the screening

- ☐ Staff time for preparation (possibly parent notification, set up of room(s), training of volunteers).
- ☐ Staff time for screening.
- ☐ Staff time for follow-up (documentation, referral letter, follow-up with parents).
- ☐ Building costs (heat, light, room space, phone).
- ☐ Miscellaneous supplies (screening tools, forms, copying).

2. Cost to children's health and well being and time in schools

- ☐ Cost of missing children out of class.
- ☐ Cost of false positives—children who do not need treatment but are referred for treatment.
- ☐ Cost of false negatives—children who passed the screening but need treatment.
- ☐ Cost to parents for complete eye exam if referred (time off work, transportation, i.e. follow-up appointments).

In the National Association of School Nurses (NASN) Guidelines, 2005, a cost analysis of vision screening in schools is provided¹. It assumes a screening program with one nurse, one health aide and screening for 500 students. Because costs vary across the country, cost averages were used in the calculations. The screening time used was five days with two days of preparation and planning, and three days for referral of students and follow-up. The total cost of the screening was calculated at \$3,266.25. This averaged out to \$466.61 per day or \$6.53 per student. Using the cost of \$15 per

screening in a community program, it would appear that screening in a school is more cost effective.

Several studies using reimbursement codes as reference points reinforced this finding and concluded that screening in schools is far less expensive than comparable screening in other venues of the health care systems¹⁹. It is estimated that the provision of health services in schools in many U.S. school districts is less than 1 per cent of the district's annual budget, and the percentage of health services dollars devoted strictly to screening activities is a fraction of that¹⁹.

Consideration needs to be given, however, to the wide variety of quality measures in place in each school which influences the reliability of the screening. Many schools use parent or staff volunteers who may not be well trained and who do not have good inter-rater reliability. The decreased quality may result in a higher number of false negatives (those children who were not detected but should have been) as well as a higher number of false positives (those children who were detected but should not have been). It should be noted also that the screening environment is often not ideal to minimize noise and distractions that can particularly influence younger children.

In the 2004-05 school year in Washington State, 194 districts out of a total of 296 districts reported to the Office of Superintendent of Public Instruction (OSPI) that 127,989 students in grades K, 1,2,3,5, and 7 were screened for vision. Using an average of \$6.53 per student, the total cost to those schools reporting was \$835,768.17. (Washington State data from OSPI School Nurse Corps). As noted in Section II, it is widely understood that untreated visual deficits can affect the quality of life and influence future activities and choices. It is less obvious and less supported by evidence that detection of vision deficits improves educational learning outcomes which is the primary concern of school administrators and school boards. If the cost associated with staff and student time necessary for vision screening cannot be justified in terms of educational outcomes, it will be less likely to be viewed as a priority activity by school administrators.

The cost for referrals is also a concern for school districts. While this is generally the responsibility of the parent, if a child is special education eligible, schools may be responsible to cover the cost of a comprehensive exam as part of an educational assessment if the exams found to be educationally relevant. With 9,000 students deemed eligible for special education every year in Washington State, and the cost of a comprehensive exam estimated at \$175, the cost to the schools could be as high as \$157,500 if only 10 per cent of those eligible students are referred for comprehensive eye exams.

Benefits of a School Screening Program

The benefits of a school screening program are significant compared to a community or office-based screening program¹⁹. There is ready access to the target population and it provides for screening a large number of students who would not have access to other screening venues—students are a captive audience for several hours each day. Several

studies confirm that approximately 75 per cent of all students with vision problems were first identified in a school setting¹⁹. Part of the reason for this is that pediatricians often defer screening, particularly on younger children, to schools. Another reason is that screenings at schools are part of a well established and known system. There are also larger numbers of three and four year olds enrolled in publicly or privately funded programs that are attached to schools or known by them, so there is increasingly more access to this younger population group. In addition, as many school nurses witness, vision screening failure may lead to the discovery of other health related problems that have not been identified, i.e., vision may be only one of several problems the student is experiencing.

Cost of Comprehensive Exams

The cost of comprehensive exams using Medicaid reimbursement data for 2004 was \$85. The cost of a comprehensive eye exam using other insurance rates is approximately \$175. Additional cost estimates associated with an exam include subsequent eye exam as part of usual eye care (\$47), costs associated with false positive exam (\$2), and treatment costs (\$35) for a total cost per child of \$259¹⁷.

The cost per QALY for a comprehensive exam was estimated at \$28,727 more than for vision screening¹⁷. In looking at the value and benefit although the cost is much higher per child, a much higher percentage of children with conditions requiring follow-up are identified through a comprehensive exam than through screening. In addition, there are fewer false positives because of the higher specificity of the tests used, the controlled environment, and the professional status of the person conducting the exam.

Costs Associated with Treatment

It is well known and documented in the literature that earlier detection and treatment for amblyopia is beneficial; however, the American Academy of Ophthalmology indicates that amblyopia is amenable to treatment only up to nine or ten years of age.

Early detection increases the likelihood of effective treatment, decreases the negative impact and leads to a better outcome than later treatment. Treatment may include one or more of the following: patching, eye drops, glasses, surgery. The treatment outcome is a function of initial visual acuity and type of amblyopia, treatment efficacy, duration, and compliance.

There is little data available on the lifetime costs of treating amblyopia. A study published in the February 2004 issue of *Pediatrics*²¹ estimated the total mean cost of amblyopia treatment was \$1,623. This cost estimate includes medical treatment, physician charges, anesthesia charges, surgical center fees, and postoperative medication. The costs are assumed to vary based on the age at which treatment begins, but are otherwise the same whether the patient was referred from a comprehensive exam or a vision screening.

Other less tangible costs are also associated with a failure to detect and treat a child at an early age resulting in irreversible visual defects, an increased risk of blindness, and later

restrictions in educational and occupational opportunities across the lifespan¹⁷. According to a fact sheet developed by the American Academy of Pediatrics Project Universal Preschool Vision Screening, "...children with...impaired vision may have greater difficulty learning, have trouble participating in organized sports and recreational activities, have limited employment options, may have increased morbidity or mortality due to accidents, and have difficulty with psychosocial development."²⁰ One CDC supported study reported in the January 2004 Morbidity and Mortality Weekly Report (MMWR) calculated the total average lifetime costs of a person with vision impairment at \$601,000. Only a small fraction of this could be attributed to medical costs. The majority of the costs were non-medical direct costs (i.e. home modifications) and non-medical indirect costs (special education, decreased mobility and decreased employability).

One outward sign of amblyopia can be crossed eyes. Studies have proven crossed-eyed individuals are perceived as less intelligent and discriminated against academically, professionally, and socially. Emotional consequences may include children being viewed as "abnormal", interpersonal skills being affected including decreased self-confidence and poor eye contact, and parents that experience guilt and blame themselves for not detecting problems earlier¹⁰.

In terms of professional discrimination, some professions require good binocular vision and therefore exclude persons with visual defects. One 2001 study on the effect of amblyopia on career choices identified 30 occupations into which visual requirements would restrict persons with amblyopia from entering the field¹⁷. Income levels of individuals are also affected. Data from the National Academy of Sciences national Health Interview Survey (2001) suggests that visual impairment is associated with lower income. The mean income was \$3,600 per year less for those individuals with a visual impairment (excluding blindness).

One 1997 study at University of Oxford also suggested negative aspects to treatment. Quality of life might be reduced because wearing glasses and intermittent patching has a negative impact. Children in the study did not like wearing glasses or patches and parents were distressed enforcing these measures¹⁷. However, other studies conclude that there is insufficient data to understand what might happen to children whose amblyopia goes untreated.

At an approximate treatment cost of \$1,600 and a 75 per cent chance of successful treatment if begun early, the gain in terms of QALYs associated with successful treatment of amblyopia are relatively high and treatment can be considered highly cost effective¹⁷. The cost per QALY is calculated at between \$1800 and \$2281, which is very cost effective. This suggests that the screening or exam program that gets the most children into treatment is the most cost effective intervention. Additional costs associated with comprehensive exams may be offset by the gains that result from additional children who are successfully identified and treated.

Discussion

There are three major approaches to identifying children with vision problems:

- ❑ School-based vision screening programs.
- ❑ Community-based or office-based screening programs (well-child visits, Lions Club).
- ❑ Comprehensive exams by optometrist or ophthalmologist.

Each of these approaches has its benefits and its challenges. We know that early childhood is the most critical period of development for the vision system. When a child reaches the age of nine or ten years, the vision system has finished developing and it is not usually possible to make improvements to counteract the effects of amblyopia. Early diagnosis and treatment is critical to improving or restoring vision to normal. If left untreated permanent reduction in sight, loss of depth perception, and possibly functional blindness can occur.

Vision is critical for conducting activities of daily living, and affects developmental learning, communication, work life, health, and quality of life⁶. The cost of blindness is substantial and potentially devastating to the individual in terms of lost opportunity and income, and to society through disability and support payments¹⁰.

The Centers for Disease Control and Prevention (CDC) has analyzed data from multiple surveys and reports to estimate the direct and indirect economic costs associated with four developmental disabilities including visual impairment. The estimated lifetime cost in 2003 dollars for a person born with visual impairment in 2000 is expected to total \$566,000. (These are costs attributable to the impairment above ordinary costs incurred by unaffected persons in the U.S. population). This underscores the need to reduce the prevalence of these conditions and prevent development of secondary conditions⁷.

While the benefits of vision screening and comprehensive vision exams can be quantified and demonstrated, barriers exist that influence how and when children are screened or examined and prevent programs or services from being implemented successfully. These barriers need to be addressed and overcome to assure that early detection and treatment occurs universally and routinely. They include:

- ❑ ***Adequacy of optometrist and ophthalmologist workforce to provide exams and follow-up treatment:*** Even in urban areas, there are not enough eye care providers to provide follow-up treatment. The wait time for appointments is often several months. Even if a provider is available, not all providers will see children and not all providers will accept medical coupons. The number of physicians available per 100,000 in various locales was identified by Department of Health (DOH) Office of Community and Rural Health data from 2005. In urban areas there were 74 primary care physicians and 135 specialty physicians. In rural areas there were 62 primary care physicians and 78 specialty physicians.

- ❑ **Barriers in rural areas:** According to DOH Office of Community and Rural Health data from 2005, 12.5 per cent of the state population (784,000 persons) resided in rural counties which comprise 59.4 per cent of Washington's land area. There are fewer providers in rural areas so parents may need to travel great distances for an appointment. Lack of personal and public transportation can be a significant barrier for families.
- ❑ **Poverty and access to care:** According to DOH Office of Community and Rural Health data for 2005, rural populations (12.5 per cent of the state population) are more likely to live in poverty (below 100 per cent of the Federal Poverty Level) and have significantly lower median incomes. In addition, rural populations are more likely to be enrolled in Medicaid and lack health insurance. According to Children's Alliance Child Facts, in Washington State, an estimated 138,385 school-aged children (aged 5 to 17) live in poverty. This represents nearly 13 per cent of all school children in Washington (US Census Bureau estimates, 2003). Also, children with health insurance tend to be in better health, which leads to improved school health. In Washington State, 167,000 children (10 per cent of children under 19) have no health insurance.
- ❑ **Compliance by pediatricians in following their own professional standards for screening and referral¹⁵:** The American Academy of Ophthalmology recommends that all children have their vision checked by their pediatrician, family physician or ophthalmologist at or before their fourth birthday. However, pediatricians who do have access to this population often defer visual screening because of the challenge in evaluating young and sometimes uncooperative children. A random sample survey sent to 1,491 physicians nationwide indicated that many pediatricians do not follow AAP guidelines for vision screening and referral, especially in younger children. Two-thirds of pediatricians do not begin visual acuity testing at age three years as recommended, and about one-fifth do not test until age five years. In addition, one-fourth do not perform cover tests or stereopsis testing at any age.
- ❑ **Preschool-aged access:** Even though vision disorders among preschool-aged children are common, screening of this age group remains infrequent⁸. While schools have increasing access to three and four year olds, preschoolers as a whole are a non-captive audience, i.e., they do not gather in any particular place, and it is difficult to collect data on numbers and results.
- ❑ **Parental information and follow-up:** Low follow-up rates and delayed treatment are typical. The rate that has typically been reported is 33 per cent. Treatment is often delayed two years or more after repeated letters and follow-up¹⁸.

Screening and Comprehensive Eye Exams are Cost Effective

Although eye exams are more costly than screening, by using a QALY measurement for determining cost effectiveness, eye exams and screening are both considered to be very cost effective.

Even though they are more costly to perform, comprehensive eye exams are considered by all eye care professionals to be the "gold standard" for detecting amblyopia and other vision problems in children. Several studies also suggest that eye exams are more effective than vision screenings in terms of ensuring appropriate treatment for amblyopia. However, as previously noted, barriers including lack of providers, lack of access to providers, and lack of insurance to pay for exams provide the impetus to look at screening programs as a more cost effective alternative.

The treatment of amblyopia, compared with the cost of managing other common, chronic health problems, is moderately inexpensive and, therefore, very cost effective¹⁹. As a result, spending additional dollars on interventions that detect and treat large numbers of children with amblyopia are also highly cost effective.

Therefore, the screening or exam program that gets the most children into treatment is the most cost effective intervention. Additional costs associated with comprehensive exams may be offset by the gains that result from additional children who are successfully identified and treated.

The professional organizations for pediatricians, optometrists, and family practice physicians all agree that vision screening as opposed to a full eye exam for every child is a more cost effective way to protect children and extend precious health care resources¹⁰. Pediatric ophthalmologists are divided on the benefits of screening programs.

Quality Assurance of Screening Programs is Limited and Outcomes are Difficult to Quantify

There is an absence of evaluative studies in the U.S. looking at the efficacy of vision screening in schools, and little is known about the wide variety of community screening programs. A lack of standardization of vision screening methods and techniques make it difficult to determine outcome measures to evaluate program effectiveness. Many of the recent studies come from countries with universal health care. Studies need to be done that look at the cost-effectiveness of publicly funded programs

With no state (or national) standards in place, there is a lack of quality control and standardization. Screeners lack the training and competency to conduct screenings with consistent quality and there are no national or state standards of competency for vision screeners to assure an assessment of consistent quality¹⁰.

Traditional vision screening tests are influenced by the competency and interpretation of the screener, the response of the child and the environment in which testing occurs. In addition, traditional vision screening tests require a cooperative and verbal child³. It is more difficult to get accurate results if the child is pre-verbal, uncooperative, or unable to follow directions as are the pre-school age children. Screening tests also lack the specificity and sensitivity of more sophisticated tools so that they produce a significantly higher percentage of false positives and false negatives. While new testing tools such as photoscreeners and autorefractors are being developed which rely less on screener's skills and a child's cooperation, they are very costly, require more time per child, and are not designed to detect evidence of amblyopia, one of the most common and most treatable vision defects that has devastating consequences if not treated.

School Vision Screening Should Continue Even Though Barriers Exist

In their 2004 report, the Amblyopia Foundation concluded that there were compelling benefits to performing mass vision screening for school-aged children as well as pre-school children¹⁰.

While schools may acknowledge the benefit, they have limited funding to meet an increasing number of mandates. The student and staff hours devoted to in-school screenings may not be seen as cost effective by school boards and school administrators.

In terms of screening standardization, there is a complete absence of widely endorsed, age-comprehensive (birth-22) set of national standards for school screening that recommend methodology, frequency of screening, visual functions to assess, and criteria for referral. There also are no comprehensive recommendations or clinical practice standards endorsed by all the professional groups that identify specific criteria to be used in screening programs. Without that,

it is difficult to collect data to help answer some of the Washington specific questions on prevalence, referral practices, and screening processes.

While there is a lack of screening standardization, the U.S. Preventive Services Task Force found no evidence of any harm resulting from screening or from false-positive results. They concluded that the benefits of screening are likely to outweigh any potential harm³.

More Studies and Data Are Needed to Evaluate Outcomes of Screening Programs

Currently, there is an unprecedented amount of social and political momentum to improve the way we screen our nation's children for vision disorders. Increasing the number of children that receive vision screenings is a stated goal of U.S. Department of Health and Human Services Healthy People 2010 Initiative and Project Universal Pre-School Vision Screening.

Recognizing the shortcomings of current vision screening programs, legislation has been introduced in some states to mandate full eye examinations for all children prior to entering school. Although such legislation appears laudable at first glance, it is prohibitively expensive to implement on a national scale using public funds. At a conservative estimate of \$50-\$100 per child, such a program would cost billions of dollars every year.

A number of states, including Washington, are looking at creative and cost effective ways to address vision problems in children. Thirty-nine states and Washington D.C. are moving toward recommendations to provide screening prior to school entry and periodically thereafter¹⁸. This is one of the recommendations put forward by the Vision Screening Expert Workgroup. How creatively states decide to fund mandates will influence the success of the program that is implemented. Kentucky was the first state to mandate comprehensive eye exams for all children entering school. The state provides funds for those families who are uninsured. Massachusetts also requires comprehensive eye exams prior to school entry and funds their initiative with their tobacco settlement dollars.

Recently, an innovative model for vision screening based on a finder fee system was proposed at the March 2006 meeting of the American Academy of Physicians and Ophthalmologic Surgeons by Dr. David L. Guyton. The model proposed that there would be a payer or source of funds (government, third party payer, Medicaid) that would pay a finder's fee to screeners to detect children who require further examination and treatment, and who would facilitate them through the system. It would cut down on the low rate of follow-up and eliminate the unwillingness of governmental agencies to pay for screening or full eye exams on large numbers of normal children. This model would take the pressure off of schools, provide some incentive for providers to screen their young patients, and assure a more systematic way of identifying children for follow-up care.

There is insufficient research to definitively answer many important questions that are critical to establishing public policy. Washington State and the nation need to find the public will to spend time and funding on the issue. There needs to be a collaborative approach between professionals and community¹⁸. Perhaps at least equal emphasis needs to be placed on referral and follow-up as on screening.

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Appendices

- A. Glossary of Terms
- B. RCW 28A.210.020
- C. WAC 246-760
- D. SHB1951
- E. Comparison of Comprehensive Exams vs. Screening

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Appendix A—Glossary of Terms**

Amblyogenic Risk Factors – Factors that contribute to or are the result of amblyopia; may include strabismus, significant refractive error, or media opacities.

Amblyopia – Reduced vision from lack of use in an otherwise normal eye. Also known as “lazy eye”.

Autorefractor – A new technology consisting of a small, portable light-weight vision assessment system capable of detecting refractive errors. The portable autorefractor is a miniature version of refractors used in professional eye care practices.

Binocular Coordination – The ability to use both eyes together.

CPT Codes – Current Procedural Terminology codes which are developed by an editorial branch of the American Medical Association. They are used as standards to interpret and report medical procedures and services for billing purposes.

Distance Vision – The ability to see clearly and comfortably beyond arm’s reach.

EPSDT – Early Periodic Screening Diagnosis and Treatment; this is Medicaid’s child health component to fit the standards of pediatric care and meet the physical, emotional, and developmental needs of low-income children. Federal guidelines require that Medicaid cover a very comprehensive set of benefits and services for children.

Eye/Hand Coordination – The ability to use the eyes and hands together.

Eye Movement Skills – The ability to aim the eyes correctly, move them smoothly across a page, and shift them quickly and accurately from one object to another.

Focusing Skills – The ability to keep both eyes accurately focused at the proper distance in order to see clearly and change focus quickly.

Hyperopia – Also known as “farsightedness” where objects that are near are unclear.

Incidence Rate – Number of persons developing a condition within a period of time divided by the total number at risk during that time. It describes the continuing occurrence of new or developing cases.

Myopia – The most common vision problem among school-age children; also known as “nearsightedness” where objects that are far away appear unclear.

Near Vision – The ability to see comfortably at 10 to 13 inches.

Ophthalmology – A branch of medicine specializing in the anatomy, function, and diseases of the eye.

Ophthalmologist – A medical doctor who specializes in eye and vision care. Ophthalmologists are specially trained to provide the full spectrum of eye care, from prescribing glasses and contact lenses to complex and delicate eye surgery. In addition to medical school and a one-year internship, all ophthalmologists spend at least three years of residency in a hospital. Some ophthalmologists may sub-specialize in a specific area of eye care.

Optometry – A health care field that specializes in examining, diagnosing, treating, and managing some diseases and disorders of the visual system, the eye and associated structures as well as diagnose related systemic conditions.

Optometrist – A health care professional that examines the internal and external structure of the eyes to diagnose eye diseases, systemic diseases, and vision conditions. Optometrists complete pre-professional undergraduate degrees as well as an optometry residency.

Opticians – Technicians trained to fit eyeglasses, lenses, frames, and contact lenses as prescribed by an ophthalmologist or optometrist. They either complete a 2-year optician degree and/or receive on-the-job training. They are not qualified to diagnose or treat eye diseases.

Peripheral Awareness – The ability to be aware of things located to the side of the eyes while looking straight ahead.

Prevalence Rate – Refers to the number of persons in a group or population with a disease divided by the total number of persons in the group. It is a snapshot of all cases.

Red-Green Color Deficiency – Color vision deficiency is a condition in which certain colors cannot be distinguished, and is most commonly due to an inherited condition. Red/Green color blindness is by far the most common form and occurs in about 99 per cent of cases where color vision deficiency exists.

Refractive Error – A category of vision problems that refers to a loss of visual acuity. The loss of acuity is due to improper light refraction as a result of the shape of the eye. The result is a blurred image. These types of errors are eye disorders.

Screening – The use of quick and simple testing procedures to identify and separate persons who are apparently well, but who may be at risk of a disease, from those who probably do not have the disease.

Sensitivity – Refers to the measure of a screening test that assesses the percentage of children whose condition will be missed by the screening method. The lower the

sensitivity, the more children with vision problems are missed and not referred for appropriate follow up care.

Specificity – Refers to the measure of a screening test that assesses the percentage of false positives, i.e. those children who are referred for a condition that does not actually exist.

Stereo Vision—Refers to both eyes working together to provide visual perception in three dimensions; depth perception

Strabismus – Misaligned eye(s) that either turn inward or outward.

Vision Problems or Abnormalities – A general term used to describe a broad range of vision related abnormalities that may include correctable conditions such as near and farsightedness, disorders, diseases, impairment, and blindness.

Vision Impairment – The measured visual acuity of 20/70 or worse, with correction, in the better eye. Vision impairment means that a person's eyesight cannot be corrected to a "normal" level. It is a loss of vision that makes it hard or impossible to do daily tasks without specialized adaptations. Vision impairment may be caused by a loss of visual acuity, where the eye does not see objects as clearly as usual. It may also be caused by a loss of visual field, where the eye cannot see as wide an area as usual without moving the eyes or turning the head.

Visual Acuity – Clarity of sight, generally referring to the ability to see things clearly from a specific distance.

DRAFT - Not Approved by OFM

**The majority of definitions are from the American Academy of Ophthalmology, American Optometrists Association, National Library of Medicine/Medline Plus, Centers for Disease Control and Prevention, American Academy of Pediatrics and National Association of School Nurses Vision Screening Guidelines 2005.

DRAFT - Not Approved by OFM

APPENDIX B—RCW28A.210.020-040

28A.210.020

Visual and auditory screening of pupils — Rules and regulations.

Every board of school directors shall have the power, and it shall be its duty to provide for and require screening for the visual and auditory acuity of all children attending schools in their districts to ascertain which if any of such children have defects sufficient to retard them in their studies. Auditory and visual screening shall be made in accordance with procedures and standards adopted by rule or regulation of the state board of health. Prior to the adoption or revision of such rules or regulations the state board of health shall seek the recommendations of the superintendent of public instruction regarding the administration of visual and auditory screening and the qualifications of persons competent to administer such screening.

[1971 c 32 § 2; 1969 ex.s. c 223 § 28A.31.030. Prior: 1941 c 202 § 1; Rem. Supp. 1941 § 4689-1. Formerly RCW 28A.31.030, 28.31.030.]

28A.210.030

Visual and auditory screening of pupils — Record of screening — Forwarding of records, recommendations and data.

The person or persons completing the screening prescribed in RCW 28A.210.020 shall promptly prepare a record of the screening of each child found to have, or suspected of having, reduced visual and/or auditory acuity in need of attention, including the special education services provided by RCW 28A.155.010 through 28A.155.100, and send copies of such records and recommendations to the parents or guardians of such children and shall deliver the original records to the appropriate school official who shall preserve such records and forward to the superintendent of public instruction and the secretary of health visual and auditory data as requested by such officials.

[1991 c 3 § 289; 1980 c 33 § 188; 1971 c 32 § 3; 1969 ex.s. c 223 § 28A.31.040. Prior: 1941 c 202 § 2; Rem. Supp. 1941 § 4689-2. Formerly RCW 28A.31.040, 28.31.040.]

28A.210.040

Visual and auditory screening of pupils — Rules and regulations, forms used in screenings, distribution.

The superintendent of public instruction shall print and distribute to appropriate school officials the rules and regulations adopted by the state board of health pursuant to RCW 28A.210.020 and the recommended records and forms to be used in making and reporting such screenings.

[1990 c 33 § 189; 1973 c 46 § 1. Prior: 1971 c 48 § 12; 1971 c 32 § 4; 1969 ex.s. c 223 § 28A.31.050; prior: 1941 c 202 § 3; RRS § 4689-3. Formerly RCW 28A.31.050, 28.31.050.]

Notes:

Severability -- 1973 c 46: "If any provision of this 1973 amendatory act, or its application to any person or circumstance is held invalid, the remainder of the act, or the application of the provision to other persons or circumstances is not affected." [1973 c 46 § 5.]

Severability -- 1971 c 48: See note following RCW 28A.310.250.

DRAFT - Not Approved by OFM

APPENDIX C—WAC 246-760

VISUAL ACUITY STANDARDS

WAC 246-760-070 What visual acuity screening equipment must be used? Personnel conducting the screening must use a Snellen test chart for screening for distance central vision acuity. Either the Snellen E chart or the standard Snellen distance acuity chart may be used as appropriate to the child's age and abilities. The test chart must be properly illuminated and glare free.

Other screening procedures equivalent to the Snellen test may be used only if approved by the state board of health.

[Statutory Authority: RCW 28A.210.200. 02-20-079, § 246-760-070, filed 9/30/02, effective 10/31/02. Statutory Authority: RCW 43.20.050. 91-02-051 (Order 124B), recodified as § 246-760-070, filed 12/27/90, effective 1/31/91. Statutory Authority: RCW 28A.31.030. 87-22-010 (Order 306), § 248-148-121, filed 10/26/87.]

WAC 246-760-080 What are the visual acuity screening procedures? (1) Schools shall:

(a) Screen children with corrective lenses for distance viewing with their corrective lenses on;

(b) Place the results of screening, any referrals, and referral results in each student's health and/or school record; and

(c) Forward the results to the student's new school if the student transfers.

(2) If school personnel observe a child with other signs or symptoms related to eye problems and if the signs or symptoms negatively influence the child in his or her studies, school personnel shall refer the child to the parents or guardians for professional care.

[Statutory Authority: RCW 28A.210.200. 02-20-079, § 246-760-080, filed 9/30/02, effective 10/31/02. Statutory Authority: RCW 43.20.050. 91-02-051 (Order 124B), recodified as § 246-760-080, filed 12/27/90, effective 1/31/91. Statutory Authority: RCW 28A.31.030. 87-22-010 (Order 306), § 248-148-123, filed 10/26/87.]

WAC 246-760-090 What are the visual acuity screening referral procedures? Schools shall rescreen students having a visual acuity of 20/40 or less in either eye as determined by the Snellen test or its approved equivalent within two weeks or as soon as possible after the original screening. Failure is indicated by the inability to identify the majority of letters or symbols on the thirty foot line of the test chart at a distance of twenty feet.

Schools shall inform parents or guardians of students failing the second screening, in

writing, of the need and importance for the child to receive professional care.

[Statutory Authority: RCW 28A.210.200. 02-20-079, § 246-760-090, filed 9/30/02, effective 10/31/02. Statutory Authority: RCW 43.20.050. 91-02-051 (Order 124B), recodified as § 246-760-090, filed 12/27/90, effective 1/31/91. Statutory Authority: RCW 28A.31.030. 87-22-010 (Order 306), § 248-148-131, filed 10/26/87.]

WAC 246-760-100 What are the qualifications for visual screening personnel? (1) Screening must be performed by persons competent to administer screening procedures as a function of their professional training and background or special training and demonstrated competence under supervision.

(2) Technicians and nonprofessional volunteers must have adequate preparation and thorough understanding of the tests as demonstrated by their performance under supervision.

(3) Supervision, training, reporting and referral shall be the responsibility of a professional person specifically designated by the school administration. He or she may be a school nurse or public health nurse, a special educator, teacher or administrator who possesses basic knowledge of the objectives and methods of visual acuity screening, supervisory experience and ability, demonstrated ability to teach others and demonstrated capacity to work well with people.

(4) Screening may not be performed by opticians, optometrists, or opticians or any individuals who may have a conflict of interest.

[Statutory Authority: RCW 28A.210.200. 02-20-079, § 246-760-100, filed 9/30/02, effective 10/31/02. Statutory Authority: RCW 43.20.050. 91-02-051 (Order 124B), recodified as § 246-760-100, filed 12/27/90, effective 1/31/91; Order 63, § 248-144-150 (codified as WAC 248-148-150) filed 11/1/71.]

APPENDIX D—SHB1951

SUBSTITUTE HOUSE BILL 1951

AS AMENDED BY THE SENATE

Passed Legislature - 2005 Regular Session

State of Washington 59th Legislature 2005 Regular Session

By House Committee on Education (originally sponsored by
Representatives Quall, Talcott, Haler, Morrell, Campbell,
O'Brien, Hankins, Kagi and McDermott)

READ FIRST TIME 03/07/05.

1 AN ACT Relating to vision exams for school-aged children; and
2 creating new sections.

3 BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF WASHINGTON:

4 NEW SECTION. **Sec. 1.** The legislature finds that:

5 (1) Vision is one of the primary senses used in the early learning
6 process;

7 (2) Vision problems affecting preschool and school-age children can
8 impact a child's ability to learn;

9 (3) Economically disadvantaged children have less access to health
10 care and therefore, may have a proportionally greater likelihood of
11 having undiagnosed vision problems that may affect their ability to
12 learn;

13 (4) Vision problems in young children can be misinterpreted as
14 neurodevelopmental delay or as learning disabilities; and

15 (5) Current screening for visual acuity at distance is insufficient
16 to detect all vision defects.

17 NEW SECTION. **Sec. 2.** (1) The department of health shall convene

p. 1 SHB 1951.PL

1 a work group to reevaluate visual screening of children in public
2 schools and make any recommendations regarding changes to the rules.

3 In developing its recommendations, the work group shall, at a minimum:

4 (a) Consider the benefits of complete eye exams on public school
5 children;

6 (b) Consider when visual screening, complete eye exams, or both
7 should take place in preschool or kindergarten through high school in
8 order to ensure children are best prepared for the learning
9 environment; and

10 (c) Consider what screening techniques would be appropriate in a
11 school setting.

12 (2) In developing the recommendations, the department of health
13 shall consult with the office of the superintendent of public
14 instruction, the state board of health, the optometric physicians of
15 Washington, and the Washington academy of eye physicians and surgeons.

16 (3) The work group shall make a preliminary report to the
17 legislature and the state board of health by December 1, 2005. The
18 work group shall make final recommendations to the legislature and to
19 the state board of health by December 1, 2006.

20 (4) If specific funding for this act is not referenced by bill or
21 chapter number in the biennial omnibus appropriations act by June 30,
22 2005, this act is null and void. --- END ---SHB 1951.PL p. 2

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APPENDIX E—Comparison of Comprehensive Exams vs. Screening

A Comparison of Elements of Screening vs. Comprehensive Exams

According to the U.S. Preventive Services Task Force Guide to Clinical Prevention Services (3) the following is a comparison of the elements of each:

Comprehensive Vision Exams	Vision Screening
Conducted by ophthalmologist or optometrist	Conducted by a wide range of health professionals from public health nurses and non-professional volunteers to ophthalmic technicians
Ocular history	May include anything short of a complete eye exam
Medical history	Components may vary greatly
Family ocular and medical history	Visual acuity
Unaided acuity test	Ocular alignment
Best-corrected acuity test	Refractive errors
External ocular exam	
Internal ocular exam	
Pupillary responses	
Binocular function	
Accommodation and convergence	
Color vision	
Diagnosis	
Recommendations	

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**APPENDIX D—Report of Stakeholder Engagement Process
(Hard Copy)**

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APPENDIX E—Glossary of Terms**

Amblyogenic Risk Factors	Factors that contribute to or are the result of amblyopia; may include strabismus, significant refractive error, or media opacities.
Amblyopia	Reduced vision from lack of use in an otherwise normal eye. Also known as “lazy eye”.
Autorefractor	A new technology consisting of a small, portable light weight vision assessment system capable of detecting refractive errors. The portable autorefractor is a miniature version of refractors used in professional eye care practices.
Binocular Coordination	The ability to use both eyes together.
CPT Codes	Current Procedural Terminology codes which are developed by an editorial branch of the American Medical Association. They are used as standards to interpret and report medical procedures and services for billing purposes.
Distance Vision	The ability to see clearly and comfortably beyond arm’s reach.
Eye/Hand Coordination	The ability to use the eyes and hands together.
Focusing Skills	The ability to keep both eyes accurately focused at the proper distance in order to see clearly and change focus quickly.
Near Vision	The ability to see comfortably at 10 to 13 inches.
Ophthalmology	A branch of medicine specializing in the anatomy, function and diseases of the eye.
Ophthalmologist	A medical doctor who specializes in eye and vision care. Ophthalmologists are specially trained to provide the full spectrum of eye care, from prescribing glasses and contact lenses to complex and delicate eye surgery. In addition to medical school and a one-year internship, all ophthalmologists spend at least three years of residency in a hospital. Some ophthalmologists may sub-specialize in a specific area of eye care.
Ophthalmometry	A health care field that specializes in examining, diagnosing, treating and managing some diseases and disorders of the visual system, the eye and associated structures as well as diagnose related systemic conditions.

Optometrist

A health care professional that examines the internal and external structure of the eyes to diagnose eye diseases, systemic diseases, and vision conditions. Optometrists complete pre-professional undergraduate degrees as well as an optometry residency.

Opticians

Technicians trained to fit eyeglass lenses, frames, and contact lenses as prescribed by an ophthalmologist or optometrist. They either complete a 2-year optician degree and/or receive on-the-job training. They are not qualified to diagnose or treat eye diseases.

Red/Green Color Deficiency

Color vision deficiency is a condition in which certain colors cannot be distinguished, and is most commonly due to an inherited condition. Red/Green color blindness is by far the most common form and occurs in about 99% of cases where color vision deficiency exists.

Refractive Error

A category of vision problems that refers to a loss of visual acuity. The loss of acuity is due to improper light refraction as a result of the shape of the eye. The result is a blurred image. These types of errors are eye disorders.

Screening

The use of quick and simple testing procedures to identify and separate persons who are apparently well, but who may be at risk of a disease, from those who probably do not have the disease.

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